

## AlphaServer 800

### Technical Summary



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# DIGITAL AlphaServer 800

The DIGITAL AlphaServer 800 system provides large-server performance and features at an entry level price. It excels at applications like mail and messages, Internet web server, and remote communications server. The AlphaServer 800 incorporates many high availability features typically found only on more costly high-end servers, such as hot-swap disk drives, ECC memory, remote management console (RMC), robust server management software (ServerWORKS), and cluster support.

## Investment Protection

The AlphaServer 800 system provides investment protection you can count on. Choose from three popular operating systems: Windows NT, DIGITAL UNIX, and OpenVMS. These operating systems and thousands of applications benefit from Alpha chip performance. The CPU is based on a 21164 microprocessor that is a superscalar, super-pipelined implementation of the 64-bit Alpha RISC architecture, running at optimized price/performance speeds.

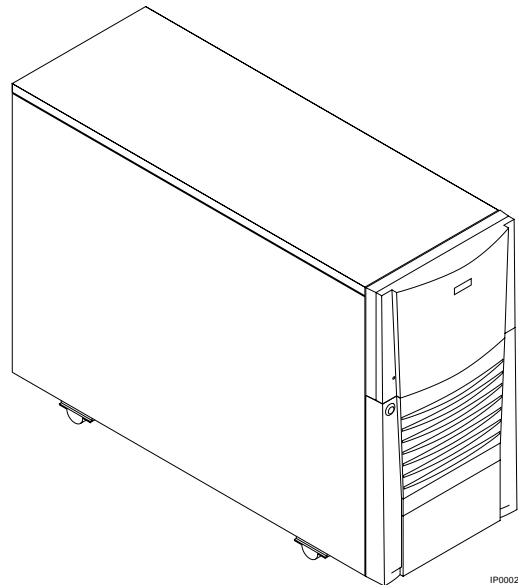
## AlphaServer 800 Pedestal System

The pedestal system is a deskside, low-noise unit designed for office space where a compact footprint and low to medium disk storage capacities are required. A motherboard contains all memory (up to 1 GB of main memory) and I/O components, PCI/EISA I/O bus with option slots, and integrated I/O controllers. A separate CPU and cache daughter card allow for easy processor upgrades.

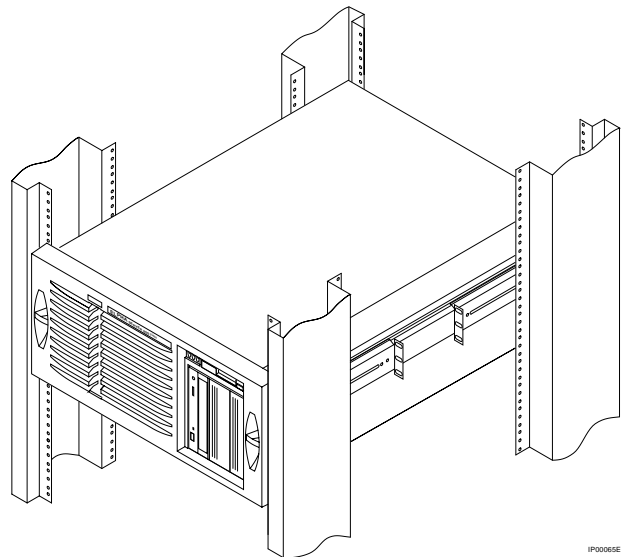
## AlphaServer 800 Rackmount System

The rackmount system utilizes the same basic system box. Mounted horizontally, it fits in a standard 19-inch rack, faced with a protective bezel instead of the hinged door. The box can have up to four internal mass-storage devices; additional storage can also be mounted in the rack.

**Figure 1 AlphaServer 800 Pedestal System**



**Figure 2 AlphaServer 800 Rackmount System**

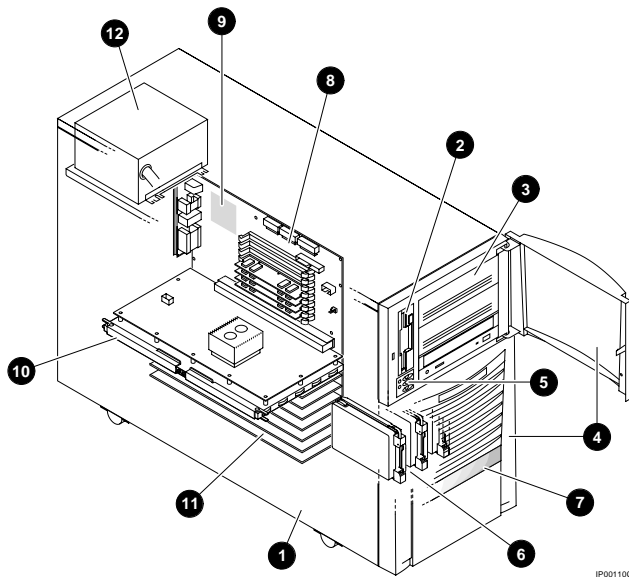


## AlphaServer 800 Pedestal System Components

The main components of the system are shown in Figure 3.

- 1) Removable side cover of system enclosure
- 2) Floppy diskette drive
- 3) Removable media drives
- 4) Lower and upper doors
- 5) Control panel
- 6) Hard disk drives
- 7) Disk status lights
- 8) Memory banks
- 9) Remote management console
- 10) CPU daughter card
- 11) PCI/EISA bus slots
- 12) Power supply

**Figure 3 AlphaServer 800 System Components**



### CPU Cards

Two CPU cards are available for the AlphaServer 800: 333 MHz and 400 MHz. Each card contains:

- a 21164 microprocessor
- a chipset interfacing the CPU, 256-bit wide ECC-protected memory subsystem, and 64-bit PCI bus
- 8 Kbytes of serial ROM, providing the CPU with power-up code
- 2 MB of third-level cache

The 21164 Alpha CPU chips have the following features:

- Floating-point unit, supports DEC and IEEE floating-point data types
- 32 integer registers, 64 bits wide
- 32 floating-point registers, 64 bits wide
- 8K on-chip, direct-mapped, write-through physical data cache
- 8K on-chip, direct-mapped, read-only virtual instruction cache
- On-chip-second-level 96 KB 3-way set associative write back cache

### System Board

The AlphaServer 800 system provides the following I/O functionality:

- SVGA controller, with 1MB Video RAM, supporting high-resolution graphics and text display for a variety of color CRT monitors without using an expansion slot
- Fast wide single-ended SCSI controller
- Bi-directional parallel port and two serial ports
- Keyboard and mouse interface
- Remote management console (RMC) for monitoring the system from a remote location

### I/O Buses

PCI and EISA I/O buses accommodate industry-standard option cards.

#### PCI Bus

The PCI (peripheral component interconnect) is the preferred I/O bus for high-performance I/O options. The PCI bus has the following characteristics:

- Fully compliant with *PCI Version 2.0 Specification*
- Operates at 33 MHz
- Supports three 32-bit options and one 64-bit option
- Supports onboard SVGA controller with 1 MB Video Ram

#### EISA Bus

The EISA bus is used for several medium-performance options, such as modems and other peripherals. It also controls the Xbus which includes the real-time clock, NVRAM, and operator control panel interface. The EISA bus is backward-compatible with ISA bus options, provided the operating system supports the device. The EISA bus has the following characteristics:

- Operates at 8.33 MHz
- Supports up to three EISA options

### System Memory

The AlphaServer 800 system memory is located on the system board. System memory consists of:

- Two banks (four DIMMs in each bank)
- 3.3V EDO ECC DIMMs
- Each bank can be 32MB, 64MB, 128MB, 256MB, 512MB
- Maximum of 1 GB memory is supported
- DIGITAL UNIX systems support one Prestoserve NVRAM option per system

## Features and Benefits

The AlphaServer 800 provides the following features to ensure high performance, expandability, enhanced reliability, and high availability.

- **System Performance**

The AlphaServer 800, with the high performance 64-bit Alpha chip architecture, is available with a 333 or 400 MHz microprocessor and 2 MB third-level cache, enhancing system performance, and significantly reducing memory transaction times. The system has an integrated PCI graphics controller and a fast wide SCSI controller, which supports tape, CD-ROM, and hard disk devices; these integrated functions free expansion slots for other I/O applications. An ultra SCSI-ready storage backplane provides high-performance drive technology.

- **Reliability and Availability**

The AlphaServer 800 system incorporates several features to enhance reliability and availability. Internal sensors monitor and detect internal system temperature, fan failure, and system status. Variable fan speeds adjust according to system temperature. ECC (error correction code) allows recovery from most cache and memory errors, and hot-swapping of 3.5-inch half-height devices allows for the replacement of disk drives while the system continues to operate.

- **Flexible Packaging**

The AlphaServer 800 system is available as a free-standing pedestal or rack-mountable box.

- **System Expansion**

Flexible memory architecture provides a 256-bit memory data path allowing incremental memory expansion from 32 MB to 1 GB. Three 32-bit PCI slots, one shared 64-bit PCI/EISA slot, and two dedicated EISA slots accommodate industry-standard option cards such as Ethernet, FDDI, SCSI, and modems. A modular storage system accommodates up to four 3.5-inch full-height SCSI devices, up to three 5.25-inch half-height devices (CD-ROM or tape), and one 3.5-inch high-density diskette drive, or one 5.25-inch half-height device and one 5.25-inch full-height device. Two serial ports and one parallel port support external options such as printer, modem, or local terminal.

## System Features at a Glance

Table 1 summarizes the AlphaServer 800 system features and specifications.

**Table 1 AlphaServer 800 Server Features**

Hardware		
Environment	Office environment (Class B)	
Processor	One Alpha 21164 (333 or 400 MHz)	
Cache on chip		
I-cache/D-cache	8 KB/8 KB	
Secondary cache	96 KB, 3-way set associative	
Upgrades	Memory, CPU, storage	
B-cache size	2 MB (16 bytes wide, block size of 64 bytes)	
Memory (max.)	1 GB	
Floppy disk	1.44 MB	
CD-ROM	600 MB 12x	
Performance	Model 5/333	Model 5/400
SPECint95	9.8	11.7
SPECfp95	12.5	13.7
SPECint_rate95	88	105
SPECfp_rate95	113	123
Internal Storage		
Removable media	Up to four, including CD-ROM and floppy diskette	
Maximum internal storage	4 hot-swap SCSI drives	
Total internal storage	36 GB	
I/O slots	3 PCI, 2 EISA, 1 shared PCI/EISA	
Max. I/O throughput		
system throughput	528 MB/sec	
PCI	264 MB/sec	
EISA	33 MB/sec	
Operating Systems		
	Microsoft Windows NT Server, OpenVMS, DIGITAL UNIX	
Availability Features		
System	System auto reboot, remote management console (RMC), disk hot-swap, ECC cache, ECC memory, ECC system bus, error logging, optional uninterruptible power supply, memory failover, thermal management	
OpenVMS clusters	Ethernet, DSSI, FDDI, SCSI, CI	
DIGITAL UNIX	SCSI, PCI to MEMORY CHANNEL™	
TruClusters solutions	interconnect	
Warranty		
Hardware	3-year, on site	
Software	90-day SPD conformance with advisory telephone support	

## Storage Architecture

The AlphaServer 800 system storage architecture is designed for maximum performance and easy operation. All storage bays are accessible from the front of the system.

### Removable Storage

The system includes a 3.5-inch floppy drive and CD-ROM. The built-in SCSI bus provides connectors for adding up to three single-ended SCSI devices.

### SCSI Storage Expansion

The system supports optional external expansion using a PCI-based SCSI controller. Up to two SCSI breakouts are provided for SCSI expansion, with a maximum expansion in excess of 1.5 TB. A PCI RAID controller can be used for hot-swap of internal or external drives.

### Hot-swap disks

Up to four 1.0-inch or 1.6-inch high 3.5-inch SCSI hard disks are accommodated in the system. These can be removed and replaced while the system remains operating.

### External Options

External options include a monitor or terminal, expansion boxes, printers, RAID controller, uninterruptible power supply (UPS), and modem.

## Reliability

### Power Control System

The power system uses several power conditioning functions to protect against high-voltage transients. The power system is capable of withstanding under-voltage conditions and power interruptions on one or more current phases without causing physical damage. The power system also provides a small amount of continuous voltage which is used by the remote management console hardware even when the system is powered off.

### Thermal Management

The system's thermal management is designed to maximize system reliability. Sensors monitor internal system temperature and fan failure, shutting down the system if necessary.

### Clustering

The AlphaServer 800 system supports clustering capabilities for DIGITAL UNIX and OpenVMS. A cluster is a loosely coupled set of systems that behaves (is addressed and managed) like a single system, but provides high levels of availability through redundant CPUs, storage, and data paths. Clusters are also highly scalable, meaning that CPU, I/O, storage, and application resources can be added incrementally to efficiently grow capacity. For customers, this translates to reliable access to system resources and data, and investment protection of both hardware and software.

- DIGITAL UNIX supports TruCluster and SCSI based clusters.
- OpenVMS supports SCSI, CI, Ethernet, FDDI, and DSSI based clusters.

## Server Management

The AlphaServer products support important operational and platform management requirements.

### Operational Management

*Server/Network Management.* ServerWORKS Manager software is included with each system. This software utilizes the Simple Network Management Protocol (SNMP) environment to assist the network or server administrator by constantly monitoring the network for problems, thus avoiding expensive downtime. The software monitors vital server information, such as CPU and file system utilization, as well as the condition of the network supported by the management console.

*Remote Server Management.* The remote management console (RMC), integrated on the system board, enables the user to monitor and control the system remotely and also provides operator paging under "alert" conditions. This console lets the administrator perform several tasks from a serial console: monitor the power supplies, temperature, and fans, and reset, halt, and power the system on or off, regardless of the operating system or hardware state.

### Platform Management

The AlphaServer 800 system supports platform management tasks such as manipulating and monitoring hardware performance, configuration, and errors. For example, the operating systems provide a number of tools to detect and display errors in the system error log file. Other software can be used to analyze and diagnose such errors.

In addition, every AlphaServer system provides robust console firmware. Hardware configuration tools and diagnostics facilitate quick installation and troubleshooting. The system operator can use simple console commands to show the system configuration, devices, boot and operational parameters, and recorded errors.

## Maintenance

The system covers slide off, making components easy to access. The CPU, memory, PCI, and EISA options are plug-in cards that require no special switch or jumper settings for normal operation.

## Performance

DIGITAL has an ongoing program of performance engineering, using industry-standard benchmarks that allow comparisons across major vendors' systems. These benchmarks against competitive systems are based on comparable CPU performance, coupled with comparable memory and disk expandability.

Remember that system performance depends on application characteristics. Thus, benchmark information is one helpful "data point" to be used in conjunction with other purchase criteria such as features, service, and price.

### Sources of Performance Information

You can access performance information from DIGITAL using your fax machine as well as several online sources.

- *InstaFACTS*. The InstaFACTS fax service delivers information directly to your fax machine. Call 1-800-723-4431 (through a touch-tone phone in the U.S.A. and Canada) and 908-885-6426 (outside the U.S.A. and Canada). A catalog of documents is available from which you can order an abbreviated table of performance information, including DIGITAL performance briefs and flashes, TPC results, AIM results, and graphics results.

- *FTP*. Access performance documents from [ftp://gatekeeper.dec.com](ftp://gatekeeper.dec.com/pub/DEC/DECinfo/performance). The directory is [pub/DEC/DECinfo/performance](ftp://gatekeeper.dec.com/pub/DEC/DECinfo/performance).
- *World Wide Web*. The document URL (Uniform Resource Locator) is <http://www.digital.com/info/performance.html>.

### Information for DIGITAL Partners

DIGITAL partners can access DIGITAL's Integrated Repository from DECGenisys V1.2. *Digital Today, Business Partner Edition*, occasionally contains articles on performance of Alpha systems and announcements of available documents. Also see the Alliances and Partners web site located at <http://www.digital.com/other-servers.html>.

### Internet Server on Windows NT and DIGITAL UNIX

The AlphaServer 800 system comes ready with all popular modes of connection to the Internet. It can also be preconfigured with the most commonly used Internet applications, allowing customers immediate access to Internet information, news groups, and electronic mail.

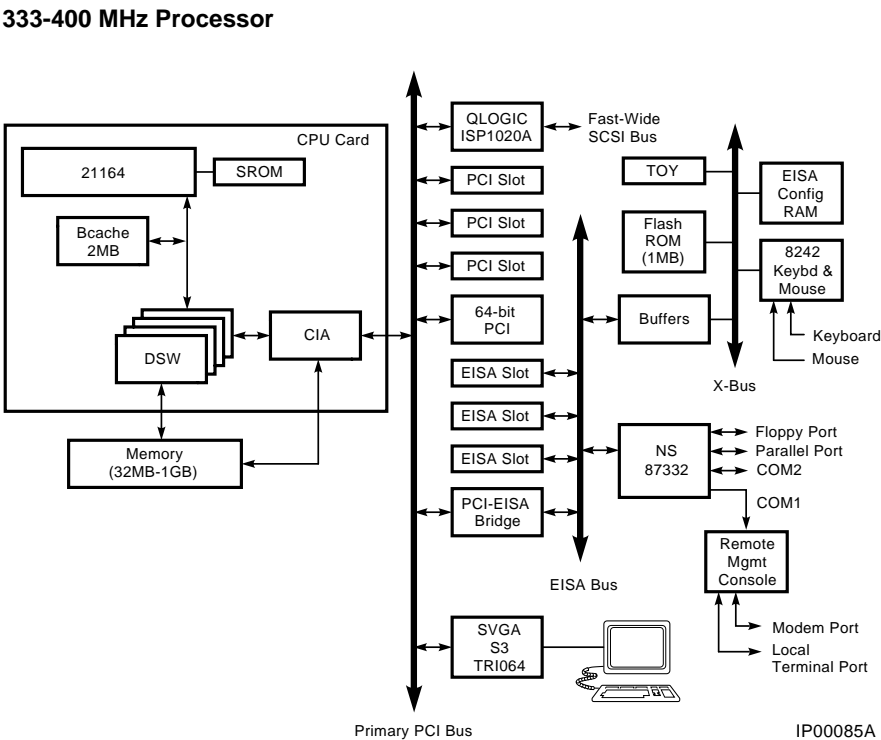
### Further Information on the World Wide Web

The web site located at <http://www.digital.com/alphaserver> offers further information on the DIGITAL AlphaServer line.

System Architecture

Figure 4 shows the AlphaServer 800 system architecture.

Figure 4 System Architecture



Physical Characteristics and Operating Environment

Table 2 lists the physical characteristics and operating conditions for the AlphaServer 800 pedestal system and AlphaServer 800 rackmount system.

Table 2 AlphaServer 800 Physical Characteristics

Characteristic	AlphaServer 800 Pedestal	AlphaServer 800 Rackmount
Height	45 cm (17.7 in.)	22 cm (8.6 in.) fits 8.75 in. [5U] standard EIA 310D
Width	22.6 cm (8.9 in.)	standard EIA 310D (RETMA) cabinet
Depth	65.8 cm (25.9 in.)	63.8 cm (25.1 in.)
Weight	typical: 24.5 kg (54 lbs) maximum: 28 kg (62 lbs)	typical: 24.5 kg (54 lbs) maximum: 28kg (62 lbs)
Operating environment	Class B	Class B
Operating temperature	10C–40°C (50-104°F)	10C–35°C (50-95°F)
Operating humidity	20-80%	20-80%
Nominal voltage	110–120 V (operating) 220–240 V (service)	110–120 V (operating) 220–240 V (service)
Frequency range	57–63 Hz (operating) 47–53 Hz (service)	57–63 Hz (operating) 47–53 Hz (service)
Power consumption (max.)	450 watts	450 watts
RMS current at nominal voltage (steady state)	7.0 amps (operating) 3.0 amps (service)	7.0 amps (operating) 3.0 amps (service)





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